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ABSTRACT

The study used data from the National Assessment of Educational Progress report to examine the relationship for young adults between functional literacy skills and educational attainment. Educational attainment was classified into four categories: less than a high school graduate, high school graduate, some postsecondary education, and college graduate. On the average, dropouts had lower literacy skills than high school graduates. There was a large increase in literacy skills for college graduates compared with high school graduates. Comparison of educational attainment and race/ethnicity showed that the literacy skills of Blacks and Hispanics were lower than those of Whites within each educational level. Additional analysis of literacy skills was done for White young adults by further subdividing some of the groupings. (The sample of Blacks and Hispanics was too small to permit further breakdown.) The literacy skills of high school equivalency certificate recipients were similar to those of high school graduates on two of three scales, but lower on the third scale. Among young adults completing at least two years of college, those currently enrolled in school had higher literacy skills than those not enrolled. The literacy scores of college students completing two or more years and currently enrolled were equivalent to the scores of graduates of four-year colleges. (YLB)

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Summary Report October 1988

Young Adult Literacy and Schooling: A Summary Report

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Executive Summary

The following analysis of functional literacy and schooling is drawn from a larger National Center for Education Statistics report titled *Young Adult Literacy and Schooling*. While this summary report presents the major findings in it, readers interested in additional information about the subject, or more detail about the analysis, should obtain the full report. Readers are also referred to the National Assessment of Educational Progress report entitled *Literacy: Profiles of America's Young Adults* (Kirsch and Jungeblut, 1986). That report, which is based on the same data, also examined the relationship between literacy and schooling, but in less detail; and it used educational groupings that are less helpful for the policy issues addressed here.

This report examines the relationship for young adults between functional literacy skills and educational attainment (classified into four categories: less than a high school graduate, high school graduate, some postsecondary education, and college graduate). This analysis can provide insights into a number of policy relevant issues, such as the relationship between dropping out of high school and literacy and whether GED recipients differ in their literacy skills from holders of regular high school diplomas.

On the average, dropouts have lower literacy skills than high school graduates. There is a large increase in literacy skills for college graduates compared with high school graduates. Looking simultaneously at educational attainment and race/ethnicity shows that the literacy skills of blacks and Hispanics are lower than those of whites within each educational level.

Additional analysis of literacy skills was done for white young adults by further subdividing some of the educational attainment groupings. (The sample of blacks and Hispanics is too small to permit further breakdowns.) The literacy skills of high school equivalency certificate recipients are similar to those of high school graduates on two of three scales, but lower on the third scale. Among young adults completing at least 2 years of college but not graduated, those currently enrolled in school have higher literacy skills than those not enrolled. The literacy scores of college students completing 2 or more years and currently enrolled are equivalent to the scores of graduates of 4-year colleges and universities.

This report was prepared while the author, presently working in the U.S. Department of Education's Office of Planning, Budget and Evaluation, was on the NCES staff.

U.S. Department of Education
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Young Adult Literacy and Schooling: A Summary Report

by Audrey Pendleton

There is mounting concern about the literacy level of the American population. Much of this concern is due to the perceptions of the effect literacy has on economic productivity and unemployment. Employers feel that many employees do not have the literacy skills that jobs require. Many students leave high school before graduating. And there are numerous reports of students graduating from high school without literacy skills.

Literacy standards in the United States have changed as education levels have risen and as the number of tasks requiring literacy and the complexity of those tasks have increased. The rise in literacy expectations is partly due to a change in the nature of work, a continuing shift from manufacturing to an information/service economy. With these changes in expectations have come changes in perceptions of adequate literacy levels. To respond to this change in the nature of work, the labor force increasingly will need to possess broad literacy skills as opposed to job-specific training. The ability to sign one's name or read at the fourth-grade level or even eighth-grade level is not adequate for American workers in a changing, technological world. America's labor market, military, and political and economic processes require citizens with relatively high levels of literacy.

In 1985, the National Assessment of Educational Progress (NAEP) completed an assessment of the functional literacy skills[1] of adults ages 21 to 25 years old--those in the process of completing formal education and entering the job market. NAEP used no single measure or specific point on a scale to separate the "literate" from the "illiterate." The NAEP approach provides a means for understanding the types and levels of literacy skills that, once acquired, allow an individual to use a broad range of materials for different purposes successfully. For this assessment, NAEP defined literacy as using printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential.

NAEP concluded that there is a serious literacy problem, but the problem is not illiteracy for the overwhelming majority in the 21-25 age group. Almost all young adults were able to perform easy tasks; however, only a small percentage were able to do well on complex and challenging tasks (Kirsch and Jungeblut, 1986).

NAEP reported literacy performance on three scales representing distinct dimensions of functional literacy: prose, document, and quantitative. The dimensions of literacy scales are[2]:

Prose comprehension is the knowledge and skills needed to understand and use information from texts such as editorials, news stories, and poems.

Document literacy is the knowledge and skills required to locate and use information contained in nontextual material such as job applications, payroll forms, bus schedules, maps, tables, and indexes.

Figure 1.--Example of tasks at or above selected points on the three literacy scales

Scale score*	Scale: Prose	Scale: Document	Scale: Quantitative
500			
400	Identify appropriate information in lengthy newspaper column (397)		
375	Orally interpret distinctions between two types of employee benefits (371)		Estimate cost using grocery unit-price labels (376)
350	State in writing argument made in lengthy newspaper column (340)	Use bus schedule to select appropriate bus for given departures & arrivals (334-365)	Determine tip given percentage of bill (356)
325	Locate information in a news article (313)	Use sandpaper chart to locate appropriate grade given specifications (320)	Determine correct change using menu (337)
300		Follow directions to travel from one location to another using a map (300)	Enter & calculate checkbook balance (281-293)
275	Write letter to state that an error has been made in billing (277)	Use index from an almanac (278)	
250	Locate information in sports article (2-feature) (262)	Complete a check given information on a bill (255)	Total bank deposit entry (233)
225		Enter date on a deposit slip (221)	
200	Write about a job one would like (199)		
175		Enter caller's number on phone message form (181)	
150		Locate expiration date on driver's license (160)	
125			
100		Sign your name (110)	
0			

*Number indicating difficulty level designates that point on the scale at which individuals with that level of proficiency have an 80 percent probability of responding correctly.

SOURCE: J. Kirsch and A. Jungeblut, Literacy: Profiles of America's Young Adults, 1986.

Quantitative literacy is the knowledge and skills needed to apply arithmetic operations, either alone or sequentially, that are embedded in printed materials, such as balancing a checkbook, figuring a tip, completing an order form, and determining the amount of interest one would pay on a loan from a loan advertisement.

The literacy scales run from 0 to 500. Figure 1 shows examples of survey tasks at various points on the three scales.

Literacy and Level of Schooling

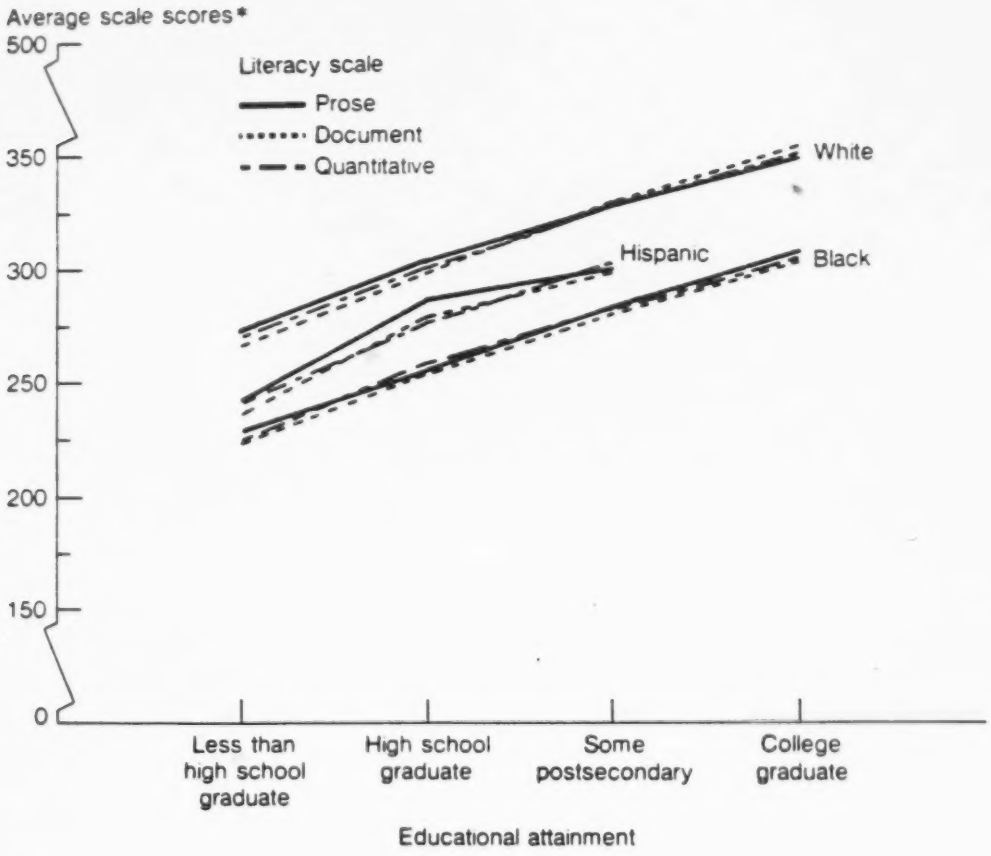
The NAEP data are not designed to show cause and effect between literacy skills and schooling, that is, which comes first, higher literacy skills or additional schooling. However, performance on the three functional literacy scales can be linked to educational attainment to show the level of literacy of young adults with different amounts of schooling. Figure 2 shows that literacy scale scores increased significantly[3] with each level of educational attainment: less than a high school education, graduation from high school, completion of some postsecondary studies, receiving a 4-year college degree.

The NAEP study shows that there were gaps between the literacy skills of whites and those of minority groups. On the average, the literacy skills of black youth were lower than those of white youth on all three scales. Hispanic young adults performed midway between their black and white peers. Portions of the gaps in literacy levels between white young adults and black and Hispanic young adults could be attributed to the lower educational attainment of blacks and Hispanics. However, the differences between white and minority young adults also were large within each level of educational attainment. On the average, black high school graduates scored lower on the literacy scales than white young adults who had not completed high school, and the literacy scores of black college graduates were similar to those of white high school graduates.

Average scores do not reflect the range of proficiency within educational groupings or racial/ethnic groupings. The distributions of literacy proficiency overlapped considerably for racial/ethnic and educational groups. For example, on average, white high school graduates scored 300 on the prose scale compared with 253 for black high school graduates. However, 15 percent of black high school graduates scored at least 300 on the prose scale and 12 percent of white high school graduates scored less than 250.

By examining differences in literacy skills across levels of educational attainment, a number of policy-relevant questions can be addressed. How do high school dropouts compare with high school graduates in functional literacy? Are the literacy skills of high school equivalency certificate recipients similar to those of high school graduates? Are the literacy skills of young adults enrolled in college more similar to those of college graduates or to those of young adults who have dropped out of college? That is, do literacy skills increase during college?

Figure 2.--Average scale scores of young adults, ages 21 to 25, on the prose, document, and quantitative scales, by race/ethnicity and educational attainment: 1985



*Based on those who took the assessment (98 percent of the sample).
SOURCE: National Assessment of Educational Progress, Young Adult Literacy Assessment, 1985 (unpublished tabulations, 1987).

High School Graduation

In general, high school dropouts scored lower than high school graduates on the literacy scales. Higher proportions of high school graduates than dropouts could perform tasks at varying levels of complexity. For example, over 80 percent of high school graduates compared with 55 to 60 percent of high school dropouts were able to locate a particular intersection on a street map, or add two entries on a bank deposit slip (250 level). Moving up the scale in level of complexity, fewer than one-fourth of high school dropouts, but almost one-half of high school graduates were able to locate information in a text page of an almanac or in a news article; identify information in a graph predicting use of various sources of energy through the year 2000; or make entries and calculate a checkbook balance (300 level).

While there were big differences in the literacy skills of young adults with less than a high school education and those of high school graduates for all racial/ethnic groups, black and Hispanic dropouts had lower scores than white dropouts. The majorities of black and Hispanic high school dropouts were not able to perform tasks such as writing a letter stating that an error was made in billing, completing an address on an order form, or identifying the gross pay-to-date on a pay stub. Among the young adult population, black high school dropouts had the lowest level of literacy skills. Over 5 percent of black high school dropouts did not score at the 150 level on basic tasks such as name signing or locating the expiration date on a driver's license. Based on this survey, it is impossible to determine whether low levels of literacy skills lead to dropping out, or are a consequence of dropping out of high school. However, the social and economic consequences are costly to the individual and to society regardless of which comes first.

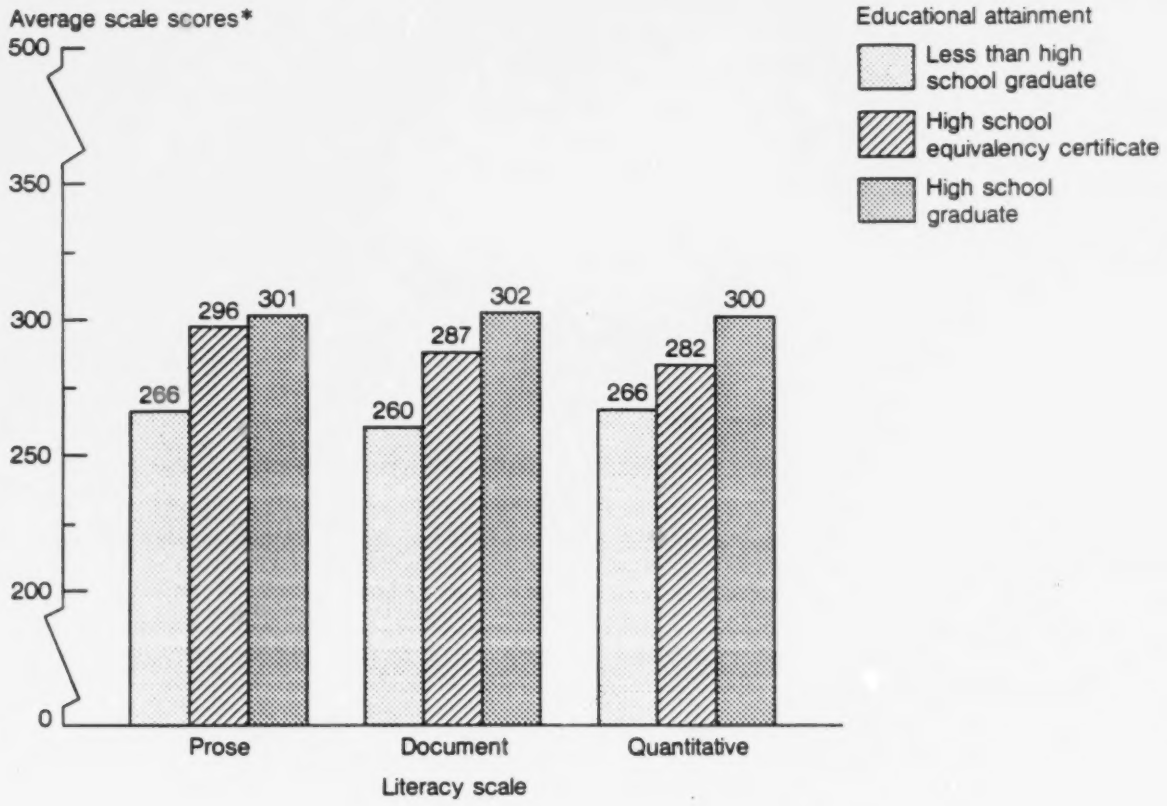
High School Equivalency Certificates

Each year about one-half million people are awarded high school equivalency certificates through programs such as the General Educational Development (GED) Testing Program. High school equivalency certificates are awarded for passing an examination in skill and subject areas usually required for high school graduation. There has been little research on how the occupation, income, or further education of high school equivalency certificate recipients compare with that of high school graduates.

The NAEP literacy scales enable the comparison of high school equivalency certificate recipients with high school graduates among white young adults only (Figure 3). (The samples for blacks and Hispanics were not large enough to do similar analyses.) The literacy scores of high school equivalency recipients were significantly higher than the scores of high school dropouts without equivalency certificates on the prose and document scales, and tended to be higher[4] on the quantitative scale.

High school equivalency recipients and high school graduates scored similarly on the prose scale, but high school graduates scored slightly higher on the document and quantitative scales. This difference was due largely to higher proportions of high school graduates at the upper range of the document and quantitative scales. Over one-half of the high school graduates, but only about one-third of the high school equivalency recipients, were able to perform tasks at the 300 level, such as following

Figure 3.--Average scale scores of white, non-Hispanic adults, ages 21 to 25, on the prose, document, and quantitative literacy scales, by educational attainment: 1985



*Based on those who took the assessment (98 percent of the sample).
SOURCE: National Assessment of Educational Progress, Young Adult Literacy Assessment, 1985 (unpublished tabulations, 1987).

directions to travel from one location to another using a map (document scale) or completing a check ledger while keeping a running total of the balance (quantitative scale). The higher literacy scores of high school equivalency certificate recipients compared with high school dropouts may reflect capabilities developed prior to dropping out of school or skills acquired since dropping out, perhaps while earning the equivalency certificate, or both.

College Enrollment and Graduation

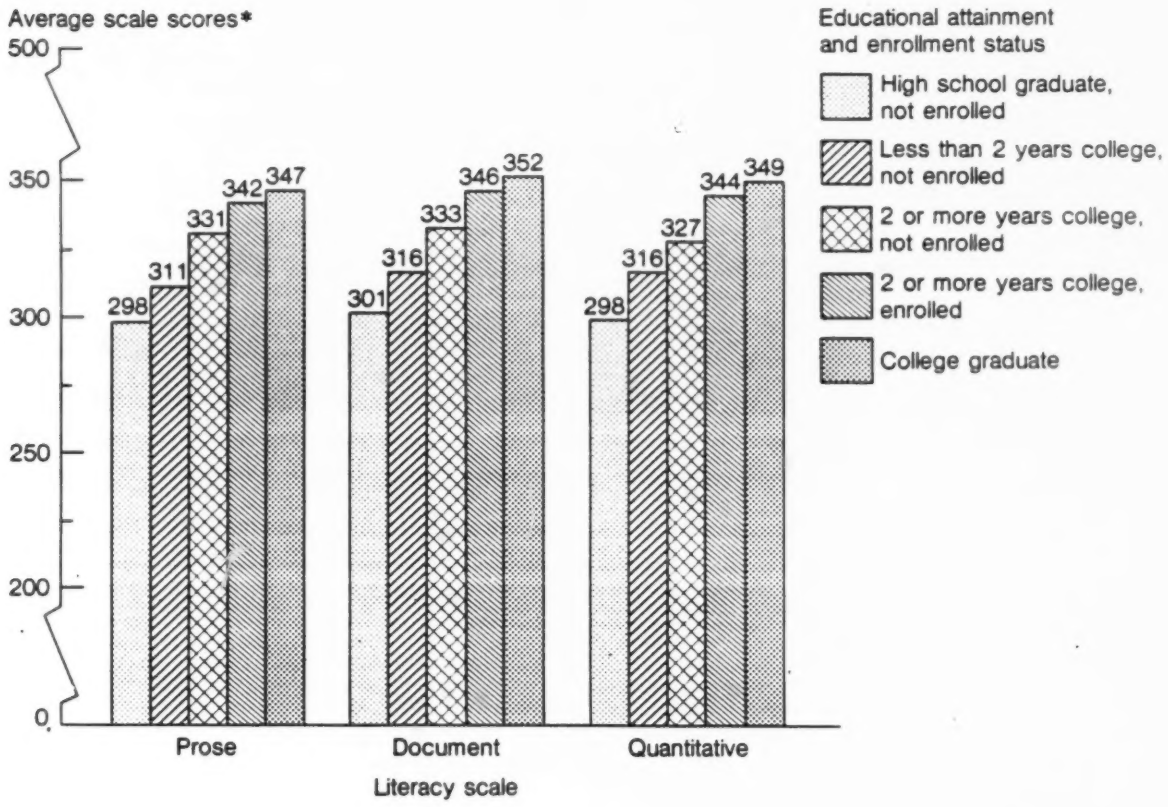
Without following a group of students as they progress through school, it is impossible to distinguish causal relationships between literacy and schooling, that is, whether more schooling contributes to literacy skills or more literate students pursue further schooling. Given the age range of the Young Adult Literacy Assessment, 21 to 25 years of age, many respondents were still in college. Four categories of high school graduates were compared however: those with no further formal schooling, those who had completed some college but were no longer enrolled, those who had completed some college and were enrolled, and college graduates. Figure 4 provides further information on the association between levels of functional literacy and schooling. (This analyis could only be done for white, young adults; the sample sizes for blacks and Hispanics were too small to permit such analyses.)

Among white, young adults not graduated from college, those with 2 or more years of college who were still enrolled had higher literacy scores than those with the same number of years of school who were no longer enrolled. However, the literacy scores of young adults with 2 or more years of college who were enrolled were equivalent to the scores of college graduates. This may suggest that more literate students persist in college, but that the last 2 years of college do not contribute to an increase in functional literacy skills as measured by the prose, document, and quantitative scales.

Clearly, there is room for further improvement. Among the most highly educated young adults in the Nation--those with a 4-year college degree--one-half of white young adults and more than 8 out of 10 black young adults were unable to perform at the 350 level of the scales. Tasks characteristic of this level include stating in writing the argument made in a long newspaper column, using a bus schedule to select the bus for given departures and arrivals, and calculating a tip in a restaurant given the tip percentage and the bill. While these tasks are at the upper levels of the literacy scales, the knowledge and skills required to complete them would generally not be considered college level. It is unclear whether the ability to perform these basic tasks is a prerequisite to higher level skills needed in college. If they are, then it is questionable whether many college students have the foundation needed to pursue college-level studies.

The level of schooling completed by young adults is significantly associated with the level of functional literacy. Literacy skills increase with more education for white, black, and Hispanic youth. However, within each level of education, literacy scores are higher for white young adults than for minority group members.

Figure 4.--Average scale scores of white, non-Hispanic high school graduates, ages 21 to 25, on the prose, document, and quantitative literacy scales, by educational attainment: 1985



*Based on those who took the assessment (98 percent of the sample).
SOURCE: National Assessment of Educational Progress, Young Adult Literacy Assessment, 1985 (unpublished tabulations, 1987).

A number of factors may contribute to the differences in literacy among racial/ethnic groups. Socioeconomic status as measured by parental education is one factor often suggested. However, the differences in literacy skills for blacks and Hispanics were large even after controlling for parental education. The difference in literacy attributable to parental education was small compared with differences among racial/ethnic groups. In other words, if the parents of white, black, and Hispanic youth had similar levels of education, the literacy scores of blacks and Hispanics would still have been substantially lower than for whites with similar levels of educational attainment.

Conclusion

The functional literacy skills of young adults improve considerably with each increase in educational attainment after controlling for background factors such as race/ethnicity and parents' education. Whether higher literacy facilitates further schooling or literacy skills can be improved through schooling cannot be established from cross-sectional data such as the Young Adult Literacy Assessment.

Whichever is the case, at each level of schooling, literacy skills are limited for large portions of young adults. While high school graduates scored much higher on the literacy scales than dropouts, many high school graduates, and even college graduates, did not possess the basic literacy skills that might be expected of them. Indeed, on average, there was no increase in the functional literacy skills of white young adults in the last 2 years of college.

Within similar levels of education, members of minority groups had less developed literacy skills than whites. Even after controlling for parental education, the literacy skills of minority groups were limited relative to the majority. Such differences are disturbing given projected demographic trends. Over the next several decades, the total number of young adults is expected to decrease and to comprise increasing proportions of minorities (Hodgkinson, 1985). If these projections are accurate, and the literacy skills of minority groups do not improve, groups of young adults entering college and moving into the labor force may have even more limited literacy skills than young adults have now. The consequences of such limited literacy could be grave.

Even if the literacy skills of minority young adults were to increase to the level of the majority, there would be cause for concern. The literacy skills of white young adults are also limited. Few white high school graduates and only one-half of white college graduates perform at the upper levels of the literacy scales. While it may not be necessary for all to have an advanced level of literacy, the skills of many young adults fall below what is needed for personal advancement and full participation in society.

The limited literacy skills of many young adults with at least a high school education raises questions about the role of schools in preparing young adults to function in the current economic, political, and social environment. Other social institutions, including the family, employers, and the media (television, radio, newspapers, and magazines) may need to share

the responsibility with schools for improving literacy skills. "It is clear that there is no single step or simple action, which if taken, will allow all individuals to become fully literate. Becoming literate in our society is a lifelong pursuit affected by such factors as home environment, economic situation, aspirations, opportunities, and education" (Kirsch and Jungeblut, 1986).

FOOTNOTES

[1] Literacy has several dimensions. *Basic* literacy emphasizes the lower levels of academic literacy, with or without direct application to life tasks. Criteria have ranged from having the ability to write one's name to having a specified grade reading level. *Academic* literacy includes the higher levels of literacy (especially literature) traditionally taught in school. *Functional* literacy has several meanings, including basic literacy. Functional literacy also refers to the skills needed to cope with daily adult life, such as reading the directions on medicine bottles and filling out an application for a driver's license. A third use of the term functional literacy is to refer to job-relevant literacy due to the growing awareness that many jobs require more than basic literacy (Hutson, 1987).

[2] Descriptions of the literacy scales and examples on tasks at various levels of the scales are taken from Kirsch and Jungeblut (1986). The criterion for selecting examples of tasks at each level was that 80 percent or more of the respondents at a given level could answer the item correctly. Thus, in describing the analysis presented here, statements such as "at this scale level, three-quarters of young adults were able to...." more precisely mean "at this scale level, three-quarters of young adults have an 80 percent probability of being able to...."

[3] All comparisons in the text, except where noted, are statistically significant at the 0.05 level of significance. Sample estimates, standard errors, and subgroup sample sizes are in the Appendix.

[4] Statistically significant at the 0.10 level.

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TECHNICAL NOTES

National Assessment of Educational Progress

The National Assessment of Educational Progress (NAEP) is an ongoing, Congressionally mandated project established to conduct national surveys of the educational performance of young Americans. It is funded by the Office of Educational Research and Improvement, U.S. Department of Education and administered by the Educational Testing Service (ETS). Since 1969, NAEP has assessed the educational accomplishments of 9-, 13-, and 17-year-olds, and occasionally young adults, in 10 learning areas. Different learning areas have been assessed and reassessed on varying cycles to determine levels of achievement at one point in time and to monitor changes in achievement nationally and for subgroups over time.

In 1985, NAEP assessed the functional literacy skills of young adults in the United States. Literacy was assessed on the basis of a broad range of tasks that simulated the diversity of literacy demands that people encounter in a multitude of settings, including job, school, home, and community. The assessment was based on a nationally representative sample of households in the 48 contiguous States. Approximately 40,000 households were contacted in order to identify and assess approximately 3,600 young adults.

The interviews lasted about 90 minutes and were conducted by about 500 interviewers. Measuring literacy skills on a variety of simulated tasks required approximately 60 minutes. The other 30 minutes were used to collect information about personal characteristics and activities that might be associated with literacy skills. These included the person's present reading and writing activities, educational and language background, family background and characteristics, and occupational status and aspirations.

Details about the survey's methodology and instrumentation are in the *Technical Report* (NAEP, 1986).

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APPENDIX TABLES

Table A1 --Sample sizes, average scale scores,* and standard errors of adults, ages 21 to 25, on the prose, document, and quantitative scale, by race/ethnicity and educational attainment: 1985

Race/ethnicity and scale	Educational attainment				
	Less than high school graduate	High school graduate	Some postsecondary	College graduate	All levels
Total	680	1,134	1,132	396	3,474
Prose	259.5 (3.2)	291.9 (2.2)	319.3 (2.2)	344.6 (3.5)	305.0 (2.0)
Document	252.9 (3.0)	292.5 (2.2)	320.8 (2.2)	348.1 (3.4)	305.0 (1.9)
Quantitative	257.2 (3.2)	291.5 (2.2)	320.4 (2.2)	344.8 (3.4)	305.0 (2.1)
White, non-Hispanic	309	615	751	322	1,997
Prose	271.9 (4.6)	300.6 (2.8)	326.0 (2.7)	346.7 (3.9)	314.4 (1.9)
Document	264.9 (4.3)	301.8 (2.7)	328.2 (2.6)	351.6 (3.7)	315.7 (1.9)
Quantitative	269.7 (4.5)	300.2 (2.9)	326.8 (2.6)	348.6 (3.7)	314.6 (2.2)
Black, non-Hispanic	253	392	261	49	957
Prose	227.5 (4.8)	253.0 (3.6)	281.0 (4.6)	307.3(10.5)	258.3 (2.4)
Document	220.6 (4.3)	251.8 (3.7)	279.8 (4.5)	302.4 (9.3)	255.7 (2.8)
Quantitative	223.3 (4.5)	256.3 (3.6)	282.8 (4.6)	302.9 (9.0)	259.1 (2.3)
Hispanic	118	127	120	25	391
Prose	240.5 (6.9)	285.8 (6.9)	299.1 (6.9)	--	285.5 (4.5)
Document	234.7 (6.7)	277.4 (6.3)	297.1 (6.5)	--	278.7 (4.4)
Quantitative	241.4 (7.4)	275.7 (6.0)	303.1 (6.7)	--	280.3 (5.0)

--Insufficient number of cases.
*Based on those who took the assessment (98 percent of the sample).
NOTE: Standard errors are in parentheses. The average scale scores are depicted in Figure 2.
SOURCE: National Assessment of Educational Progress, Young Adult Literacy Assessment, 1985 (unpublished tabulations, 1987).

Table A2.--Sample sizes, average scale scores,* and standard errors for white, non-Hispanic adults, ages 21 to 25, on the prose, document, and quantitative literacy scales, by educational attainment: 1985

Scale	Educational attainment		
	Less than high school graduate	High school equivalency certificate	High school graduate
Sample size	244	65	615
Prose	265.9 (5.2)	296.4 (7.7)	300.6 (2.8)
Document	259.5 (4.9)	287.0 (6.9)	301.8 (2.7)
Quantitative	265.7 (5.2)	282.4 (8.1)	300.2 (2.9)

*Based on those who took the assessment (98 percent of the sample).
NOTE: Standard errors are in parentheses. The average scale scores are depicted in Figure 3.
SOURCE: National Assessment of Educational Progress, Young Adult Literacy Assessment, 1985 (special tabulations, 1987).

Table A3.--Sample sizes, average scale scores,* and standard errors for white, non-Hispanic adults, ages 21 to 25, on the prose, document, and quantitative literacy scales, by educational attainment and enrollment status: 1985

Scale	Educational attainment and enrollment status				
	High school graduate, not enrolled	Less than 2 years college, not enrolled	Two or more years college, not enrolled	Two or more years college, enrolled	College graduate
Sample size	524	172	161	254	322
Prose	297.9 (3.0)	310.5 (5.7)	330.5 (5.0)	341.7 (4.3)	346.7 (3.9)
Document	301.1 (2.9)	316.0 (5.2)	332.9 (5.4)	346.1 (4.0)	351.6 (3.7)
Quantitative	298.4 (3.2)	315.6 (4.7)	327.0 (5.7)	344.2 (4.4)	348.6 (3.7)

*Based on those who took the assessment (98 percent of the sample).
NOTE: Standard errors are in parentheses. Average scale scores are depicted in Figure 4.
SOURCE: National Assessment of Educational Progress, Young Adult Literacy Assessment, 1985 (unpublished tabulations, 1987).